

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
3 March 2005 (03.03.2005)

PCT

(10) International Publication Number
WO 2005/019425 A2

(51) International Patent Classification: C12N (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number: PCT/US2004/026965

(22) International Filing Date: 18 August 2004 (18.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/496,188 18 August 2003 (18.08.2003) US

(71) Applicant (for all designated States except US): UNIVERSITY OF FLORIDA RESEARCH FOUNDATION, INC. [US/US]; 223 Grinter Hall, Gainesville, FL 33611 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HANNAH, L., Curtis [US/US]; 4400 NW 39th Avenue, #434, Gainesville, FL 32606 (US). LYERLY LINEBARGER, Carla, R. [US/US]; 6929 NW 25th Lane, Gainesville, FL 32606-0690 (US).

(74) Agents: PACE, Doran, R. et al.; Saliwanchik, Lloyd & Saliwanchik, Suite A-1, 2421 NW 41st Street, Gainesville, FL 32606-6669 (US).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2005/019425 A2

(54) Title: HEAT STABLE VARIANTS OF ADENOSINE DIPHOSPHATE GLUCOSE PYROPHOSPHORYLASE

(57) Abstract: The subject invention concerns polynucleotides encoding a small subunit of plant AGP having one or more mutations in the amino acid sequence wherein the mutation confers increased heat stability to the expressed AGP enzyme. Mutations in the N-terminus of the small subunit of heat labile plant AGP results in AGP enzymes that are significantly more heat stable compared to wild type AGP in that the mutant AGP retains significant levels of enzymatic activity following exposure to heat treatment. In one embodiment, the polynucleotide encodes a mutant small subunit of maize AGP. The subject invention also concerns methods for providing a plant with increased resistance to heat conditions. Plants with heat labile AGP can be transformed with a polynucleotide of the present invention. The subject invention also concerns these transformed plants and transgenic progeny thereof. The subject invention also concerns mutant polypeptides encoded by polynucleotides of the present invention.